HAWAIIAN HAWK NESTING STUDY

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INTRODUCTION

The Puna geothermal resource area has been the focus of keen interest on the part of potential geothermal investors and developers since the demonstration of a proven resource in the region of the HGP-A well at Pohoiki. Two wells have been drilled north of the HGP-A site (in the vicinity of Pu'u Honuaula) by Puna Geothermal Ventures.

A floral and faunal survey of this area was performed in early 1984 (Char et. al. 1984) to provide baseline data for future Environmental Impact Statements necessary for activation and associated activities at the PGV wellsites. High densities of Hawaiian Hawk (Buteo solitarius) in this 2010 acre portion of the Puna geothermal resource area became apparant during the field surveys. Because this species is considered endangered, its breeding status in the area is of some concern with regards to future geothermal development. This is particularly true of portions of the geothermal resource area that are either adjacent to or downwind of potentially active wellsites.

In order to provide a better data base from which to address these concerns, a breeding season survey was conducted to determine breeding density and to better define portions of the site used for nesting activity. The results of this survey are provided in the following sections.

METHODS

Four days of field work were performed between June 14 and June 29, 1984. The study site consisted of a one mile radius circle centered on Pu'u Honuaula, Puna, Hawaii.

Hawk populations throughout the study area were initially censused in order to provide a basis for comparison between this and the non-breeding season census data. All accessable portions of the area were covered either on foot or by car, with special attention being paid to habitats providing suitable nest sites for hawks. Census techniques used for estimating absolute densities of passerine species are generally inadequate for rare species (Emlen, 1971). Density values for the Hawaiiian Hawk were estimated primarily from sightings during the census period, with the input of additional information from observations of nesting birds.

Locations of Hawk sightings were subjected to in-depth surveys for the presence of nests or newly fledged young. When adult birds were present, their movements were monitored to determine both possible locations of nest sites and breeding status of the birds themselves.

All nest sites were located on 1:24000 USGS topographic maps of the study area for future reference. Both active and old nests were indicated.

RESULTS

Figure 1 shows the locations of hawk nests within the study area. Of the four nests discovered, only the one located about a mile to the east of the well sites was active. Here, two adult birds were observed in the early stages of the breeding cycle. Both birds were in the process of nest construction (or repair, since nests from previous years may be reused). There was no evidence of incubation or other reproductive activities at this site during two visits to the nest site. At the time that the nest was discovered, a total of five hawk were seen in the area. In addition to the two adults in the vicinity of the nest site, immature hawk were observed on two separate occaisions. Both of the young birds were vigorously chased by the resident adults, and one or both of them may have been progeny from previous breeding seasons.

While there was no apparant activity at the other nest sites, there were a number of observations of single adult birds throughout the study area. Most of these individuals were observed in foraging flight. Although birds were occaisionally censused while alight, this behavior was apparently not associated with nesting activity.

No hawk were seen outside of those portions of the study area in which hawk were found in January of 1984. However, there was evidently a change in hawk usage of different portions of the study site that occured between the months of January and June. During the January survey, the majority of hawk activity was centered around the Pu'u Honuaula area, with a few sightings near vegetated kipukas to the North and East. Activity patterns

in June were quite different, with the bulk of the sightings occuring in the vicinity of the kipuka about one mile East of Pu'u Honuaula. Here, there were numerous sightings of five recognizable individuals, as compared to only four observations of no more than two individuals in the area around Pu'u Honuaula in the same period of time. This density shift is probably the result of behavioral changes during the course of the breeding season rather than changes in response to increased human activity since the latter have been negligable.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions may be made with regards to Hawaiian Hawk populations in the Pu'u Honuaula area:

1. The number of Hawaiian Hawk within the study site is at least seven individuals, and probably does not significantly exceed that number. Seasonal variation in density of hawk is not great.

2. Both adult and immature individuals are present in this population. Observations of adult birds were commoner than those of immatures: of the seven birds in the study area, five were adults, and only two were immature. This skewed age distribution suggests that breeding activity and/or success is declining in the area.

3. The fact that only one of the five nests discovered during the course of the survey was active is also indicative of a declining use of the area for breeding.

4. No active nests were discovered in the immediate vicinity of Pu'u Honuaula during the 1984 breeding season, in spite of reports of earlier nesting in the area. This lack of breeding activity in 1984 does not necessarily preclude future nesting attempts in the area.

Since no active nests were present near the Pu'u Honuaula wellsites in 1984, there appears to be no indication for radical changes in plans for well activation at this time. However, because disturbance during the breeding season (particularly the incubation period) is such a critical factor in the breeding

success of this species (Griffin, 1984), the following recommendations are appropriate:

1. Hawk populations in the area should be regularly monitored for breeding activity between the months of March and September.

2. Breeding pairs near the wellsites should be studied during well operation to determine what detrimental effects (if any) result from well operations. Proceedures discovered to have negative effects on hawk breeding sucess in the area should be modified or curtailed as necessary to prevent impact.

3. It is of great importance that direct disturbance and harrassment of breeding birds in the area be prevented.

LITERATURE CITED

Emlen, J.T. (1971) Population densities of birds derived from transect counts. Auk 88:323-341.

Griffin, C.R. (1984) Hawaiian Hawk Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon.